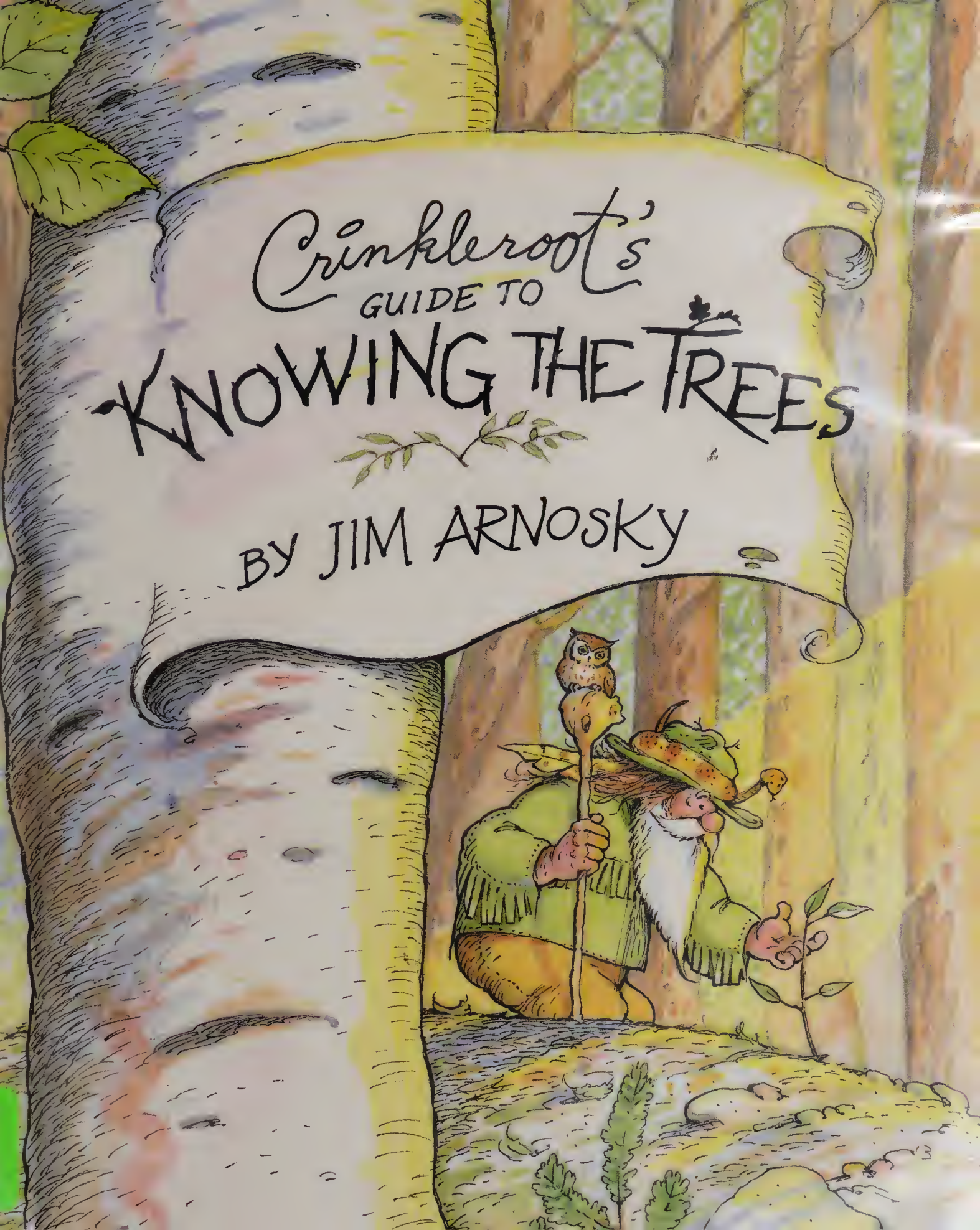
Crinkleroot's Guide to Knowing the Trees

BY JIM ARNOSKY



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Fleishers

Crinkleroot is walking in the forest.

Come join him!

Crinkleroot will tell you how to identify trees and what saplings and seedlings are. He'll show you what the trees mean to the birds and other animals. He'll take you to the place he calls a "walking stick woods." And, best of all, Crinkleroot will help you understand why he calls the trees his friends.

Crinkleroot's GUIDE TO KNOWING THE TREES

BY JIM ARNOSKY

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In order to provide picture-book quality stock at an affordable price and still save trees, this book is printed on paper composed of not less than 50 percent recycled material, which includes pulp and other by-products of the papermaking process that had, in the past, often been discarded.

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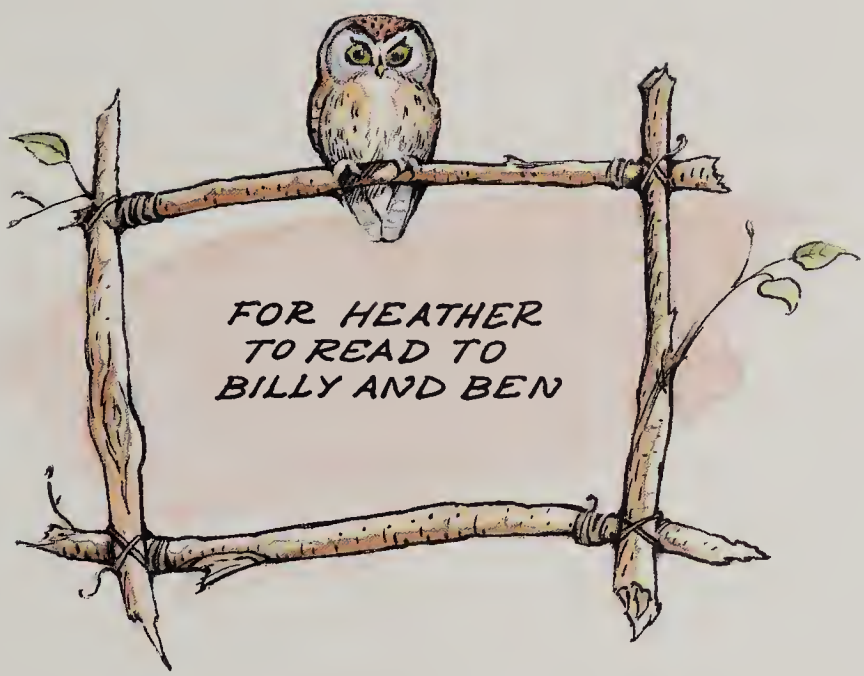
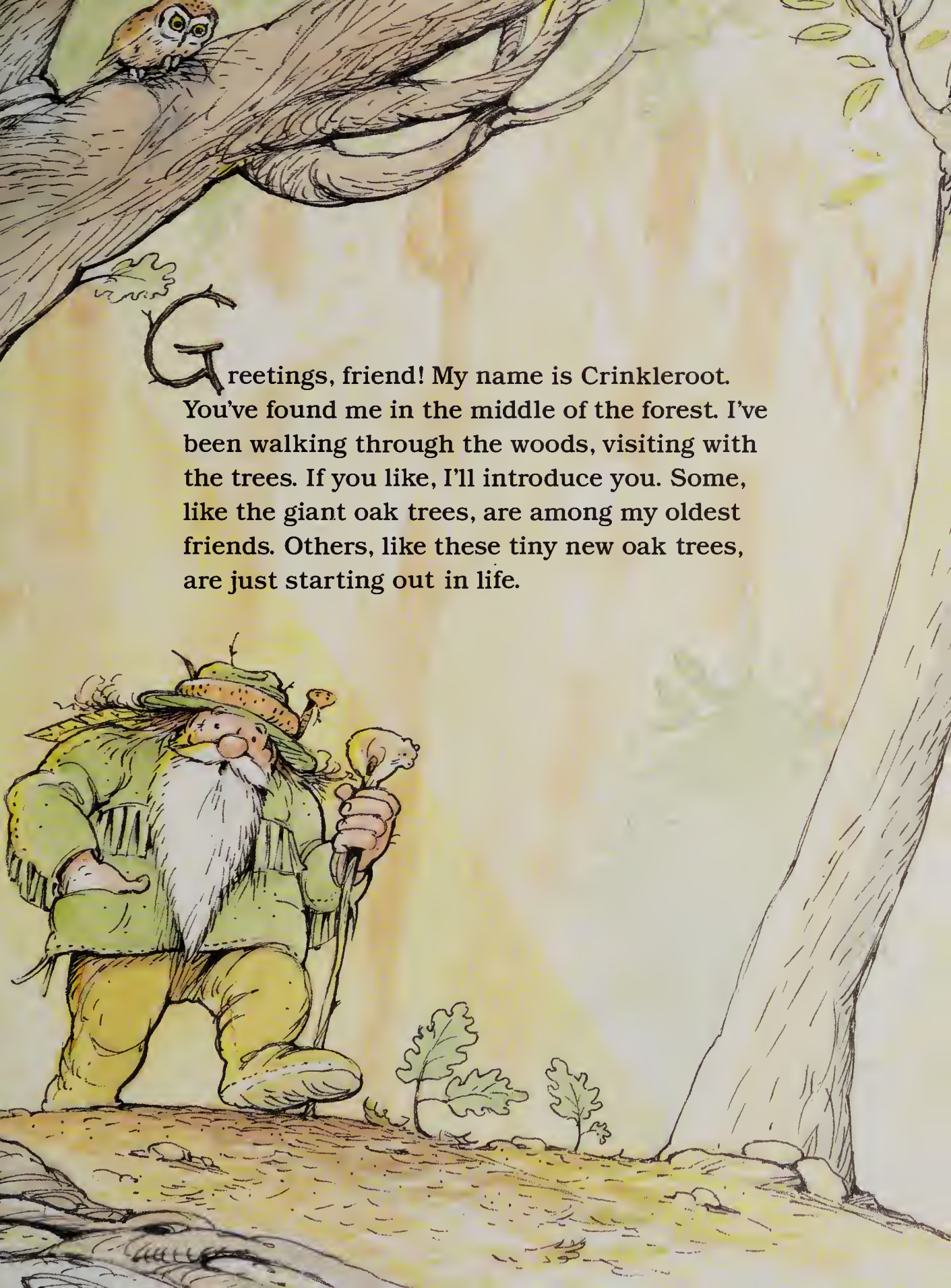
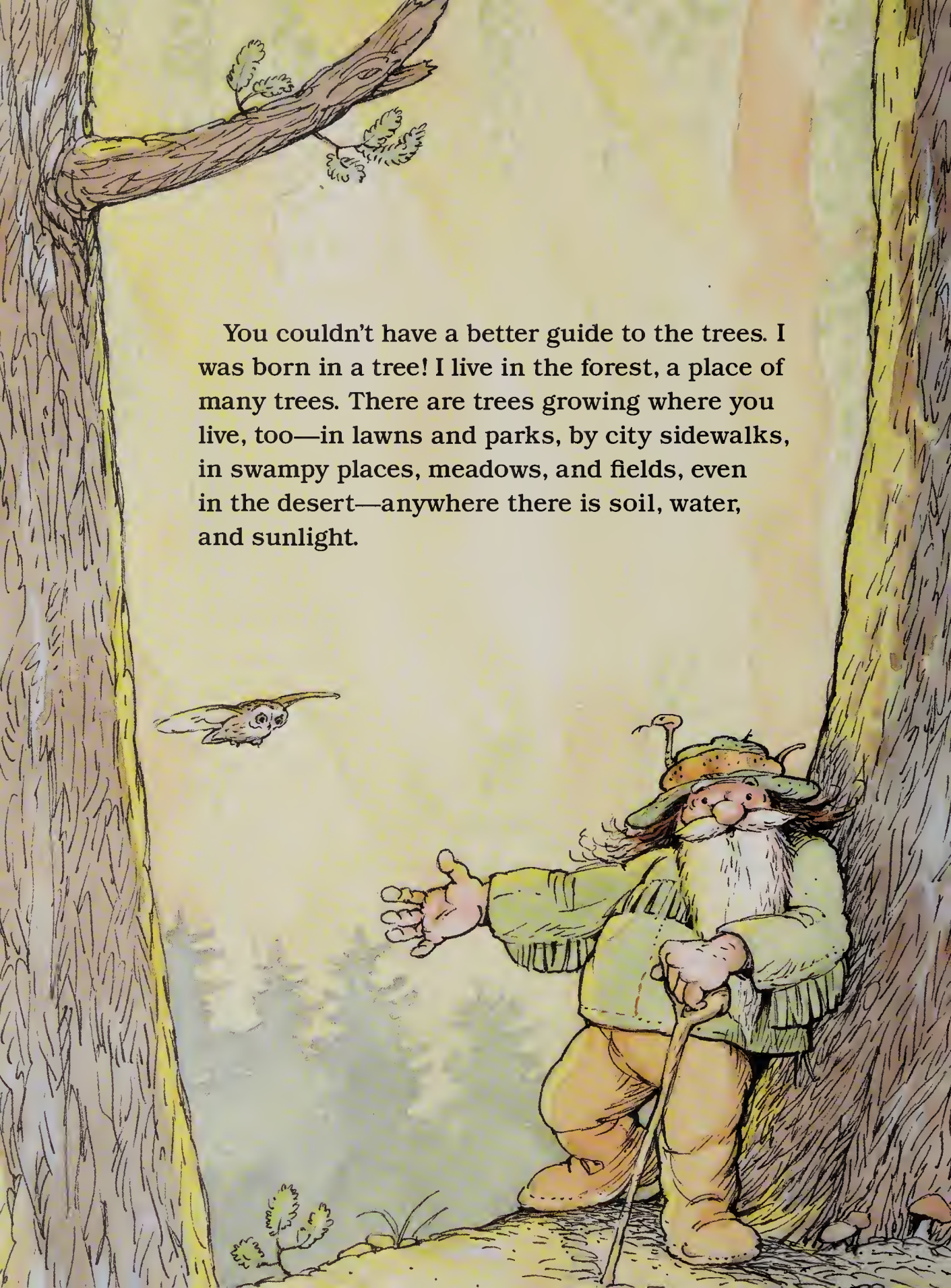
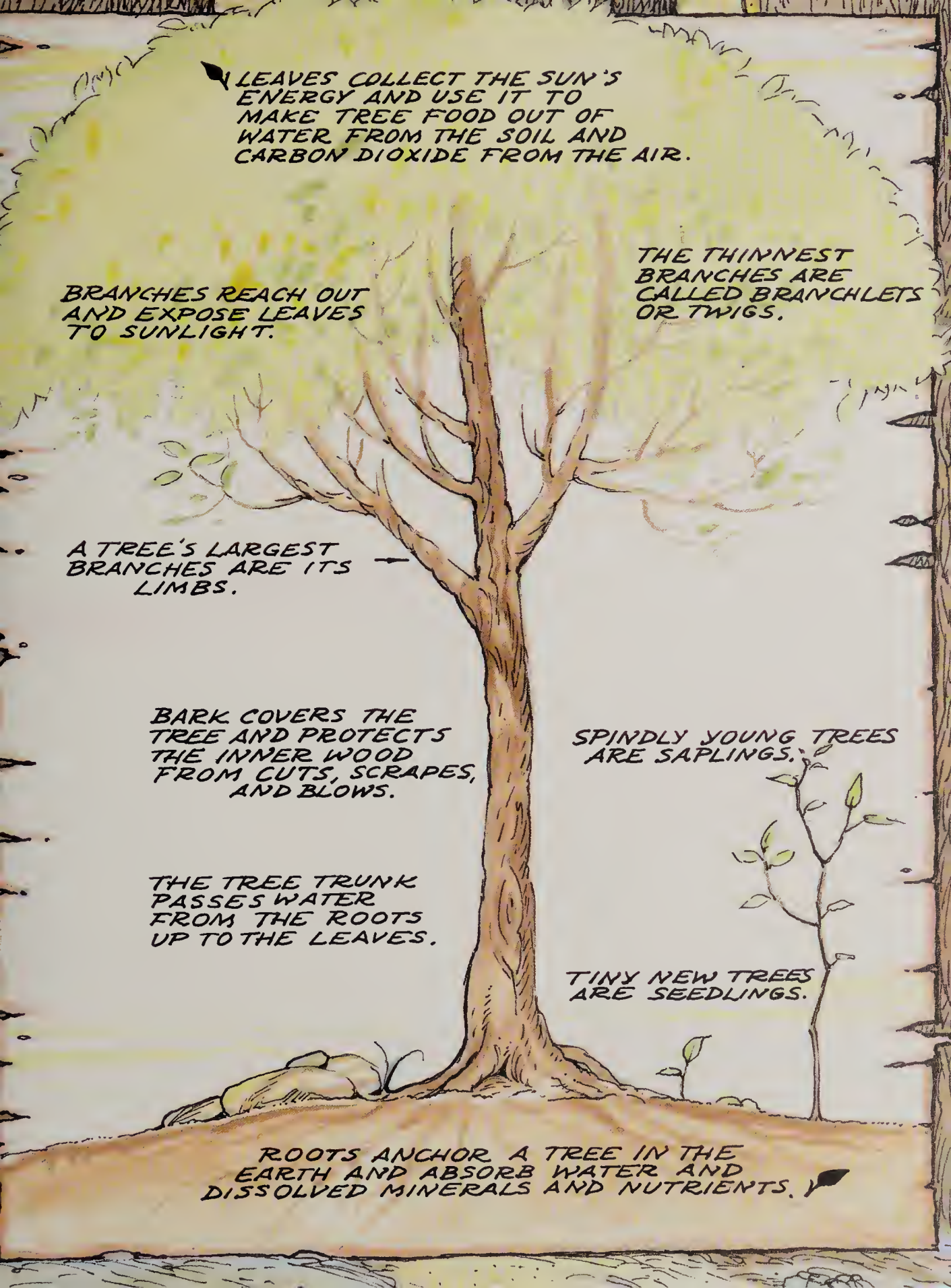

FOR HEATHER
TO READ TO
BILLY AND BEN



Greetings, friend! My name is Crinkleroot. You've found me in the middle of the forest. I've been walking through the woods, visiting with the trees. If you like, I'll introduce you. Some, like the giant oak trees, are among my oldest friends. Others, like these tiny new oak trees, are just starting out in life.



You couldn't have a better guide to the trees. I was born in a tree! I live in the forest, a place of many trees. There are trees growing where you live, too—in lawns and parks, by city sidewalks, in swampy places, meadows, and fields, even in the desert—anywhere there is soil, water, and sunlight.


LEAVES COLLECT THE SUN'S ENERGY AND USE IT TO MAKE TREE FOOD OUT OF WATER FROM THE SOIL AND CARBON DIOXIDE FROM THE AIR.
BRANCHES REACH OUT AND EXPOSE LEAVES TO SUNLIGHT.
THE THINNEST BRANCHES ARE CALLED BRANCHLETS OR TWIGS.
A TREE'S LARGEST BRANCHES ARE ITS LIMBS.
BARK COVERS THE TREE AND PROTECTS THE INNER WOOD FROM CUTS, SCRAPES, AND BLOWS.
SPINDLY YOUNG TREES ARE SAPLINGS.
THE TREE TRUNK PASSES WATER FROM THE ROOTS UP TO THE LEAVES.
TINY NEW TREES ARE SEEDLINGS.
ROOTS ANCHOR A TREE IN THE EARTH AND ABSORB WATER AND DISSOLVED MINERALS AND NUTRIENTS.

Maple, oak, birch, gum, ash, sassafras, and beech trees all have broad, flat leaves that are shed each autumn. Broad-leafed trees grow new leaves every spring.

Cedar, pine, spruce, cypress, and fir trees are all evergreens. They keep their needle-shaped leaves all through the year and stay green even in winter.

Broad-leafed trees are also called deciduous trees, or hardwood trees. You can identify hardwood trees by their leaf shape, autumn color, or seeds.

LOOK CAREFULLY AT EACH LEAF SHAPE AND SEE HOW IT IS DIFFERENT FROM OTHER LEAVES ~ EVEN SIMILAR ONES.

GINKGO

BEECH

SYCAMORE

RED MAPLE

SUGAR MAPLE

CATALPA

WHITE OAK

BLACK OAK

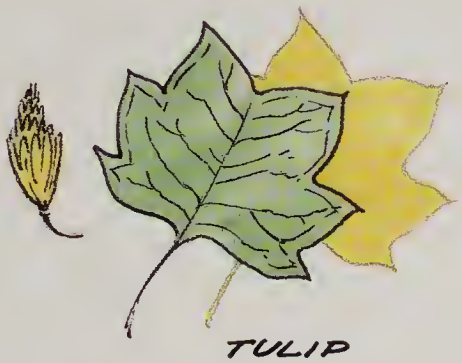
LOCUST

WHITE BIRCH

YELLOW BIRCH

BLACK GUM

BLACK ASH



TULIP

SASSAFRAS

WILLOW

SUMAC

COTTONWOOD

ASPEN

OSAGE ORANGE

BOX ELDER

NOTE~ALL LEAVES SHOWN SMALLER THAN ACTUAL SIZE

Evergreen trees are also called conifer trees, or softwood trees. You can identify softwood trees either by their needles or by their seed cones.

HERE ARE SOME DIFFERENT KINDS OF SOFTWOOD TREES FOR YOU TO LOOK FOR AND IDENTIFY.

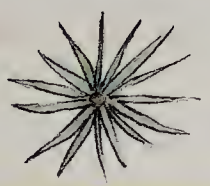
PINES HAVE LONG NEEDLES

THAT GROW IN CLUSTERS OF 2 TO 5.

PINE BOUGH

PINECONES

SPRUCE NEEDLES



SPRUCE BOUGH

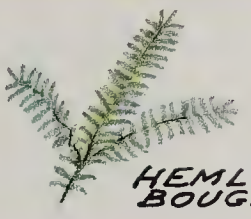
SPRUCE CONES

FIR NEEDLES GROW IN A SEMICIRCLE ON THE NEEDLE TWIG.

FIR BOUGH

FIR CONES

HEMLOCK NEEDLES GROW ONE ON EITHER SIDE OF THE NEEDLE TWIG.



HEMLOCK BOUGH

HEMLOCK CONES ARE VERY SMALL.

CEDARS ALL HAVE SCALES INSTEAD OF NEEDLES.

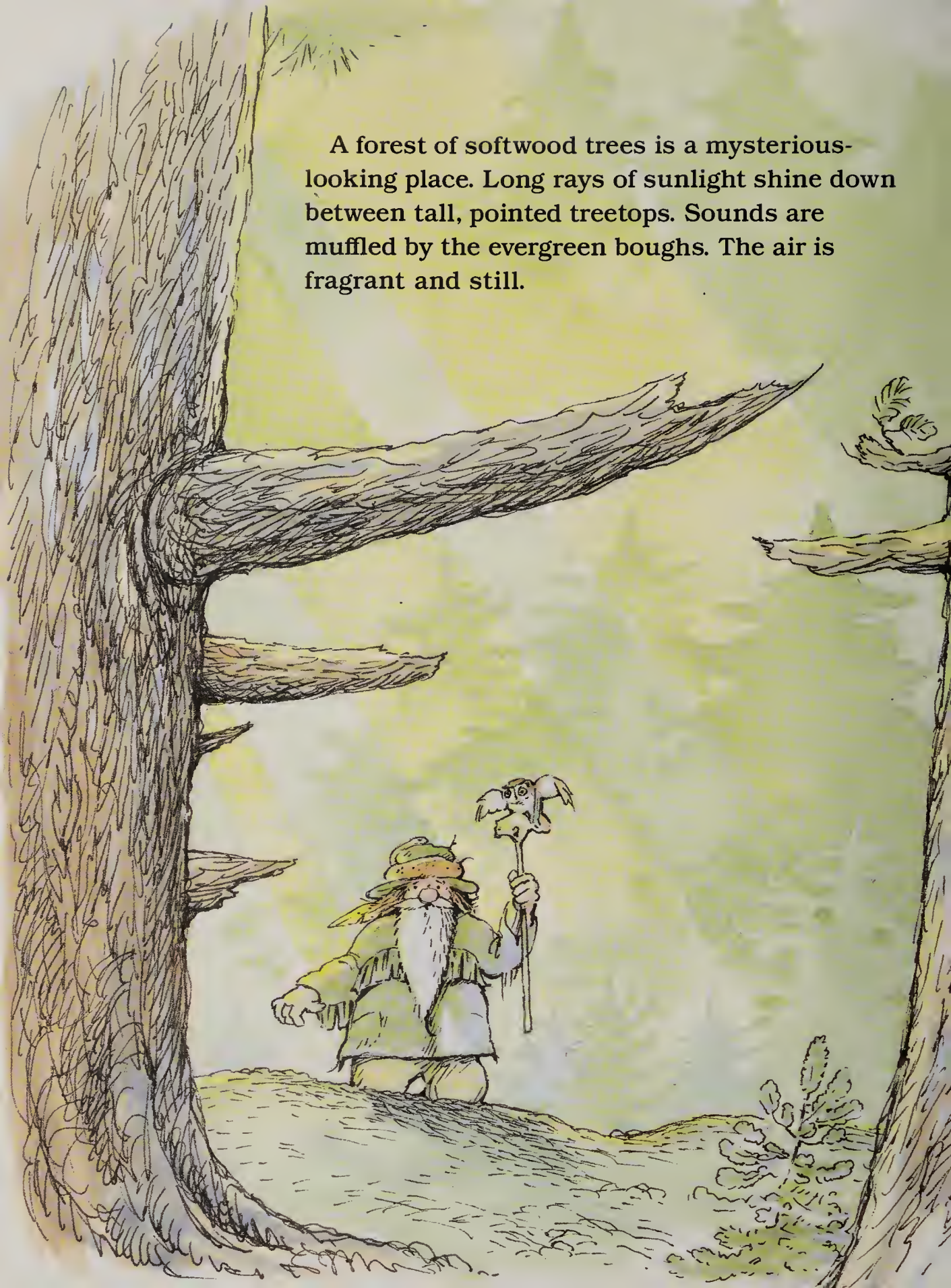
CEDAR BOUGH AND CONE

CEDAR BOUGH WITH BERRY "CONE"

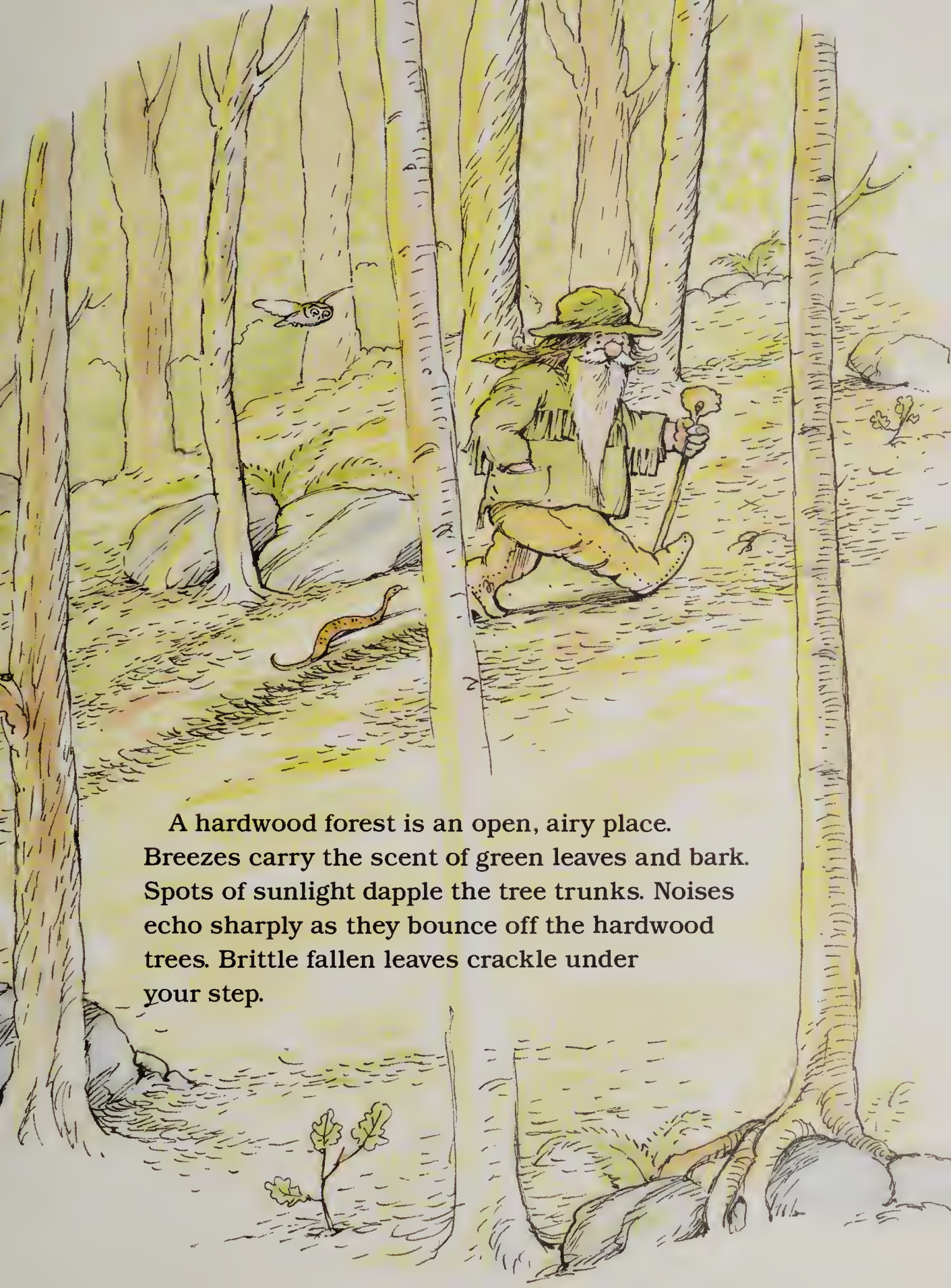
TAMARACK NEEDLES ARE SHORT AND GROW IN BUNCHES.

THE TAMARACK IS THE ONLY CONIFER TREE THAT CHANGES COLOR IN FALL.

TAMARACK CONE

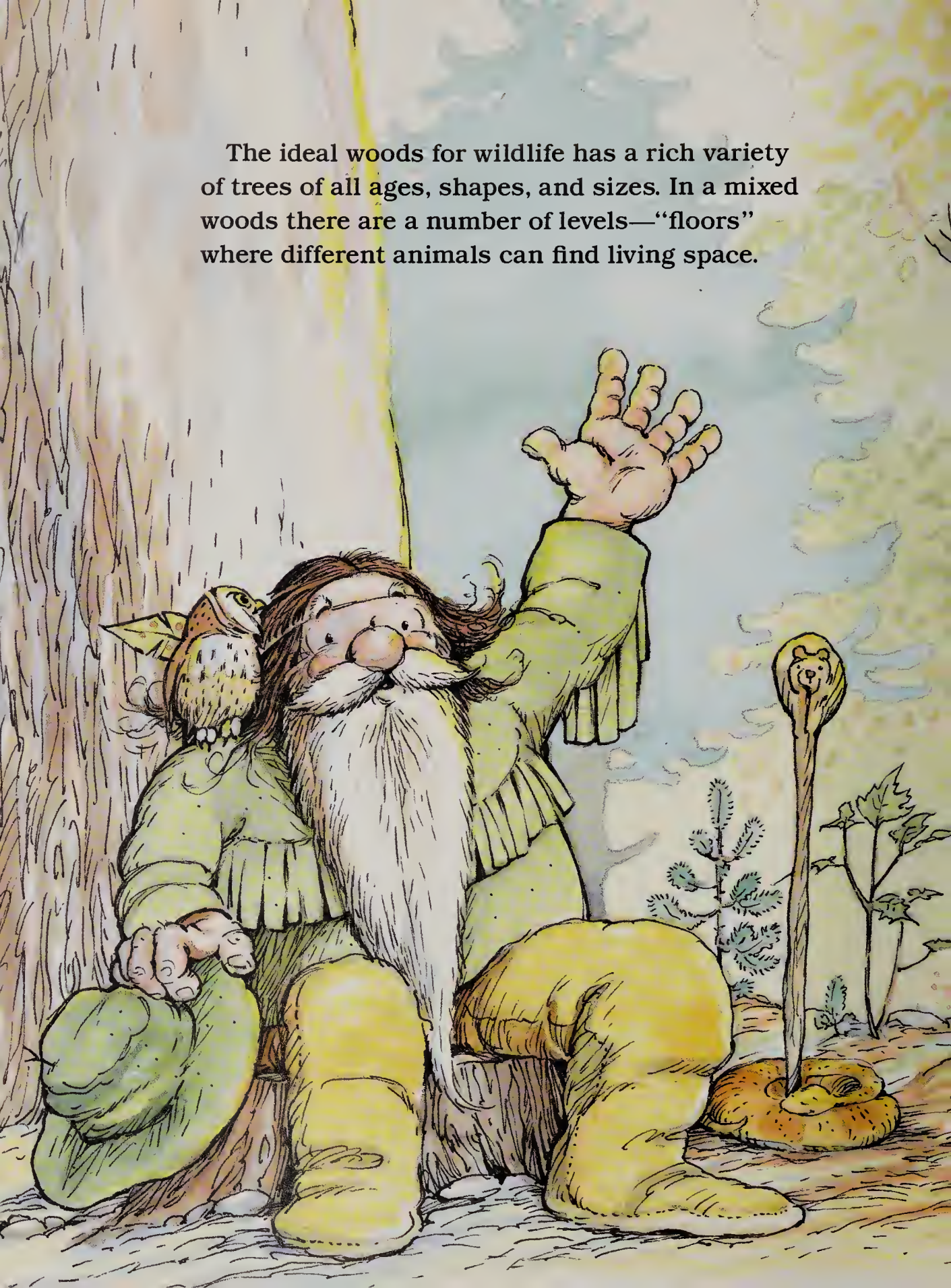


A forest of softwood trees is a mysterious-looking place. Long rays of sunlight shine down between tall, pointed treetops. Sounds are muffled by the evergreen boughs. The air is fragrant and still.



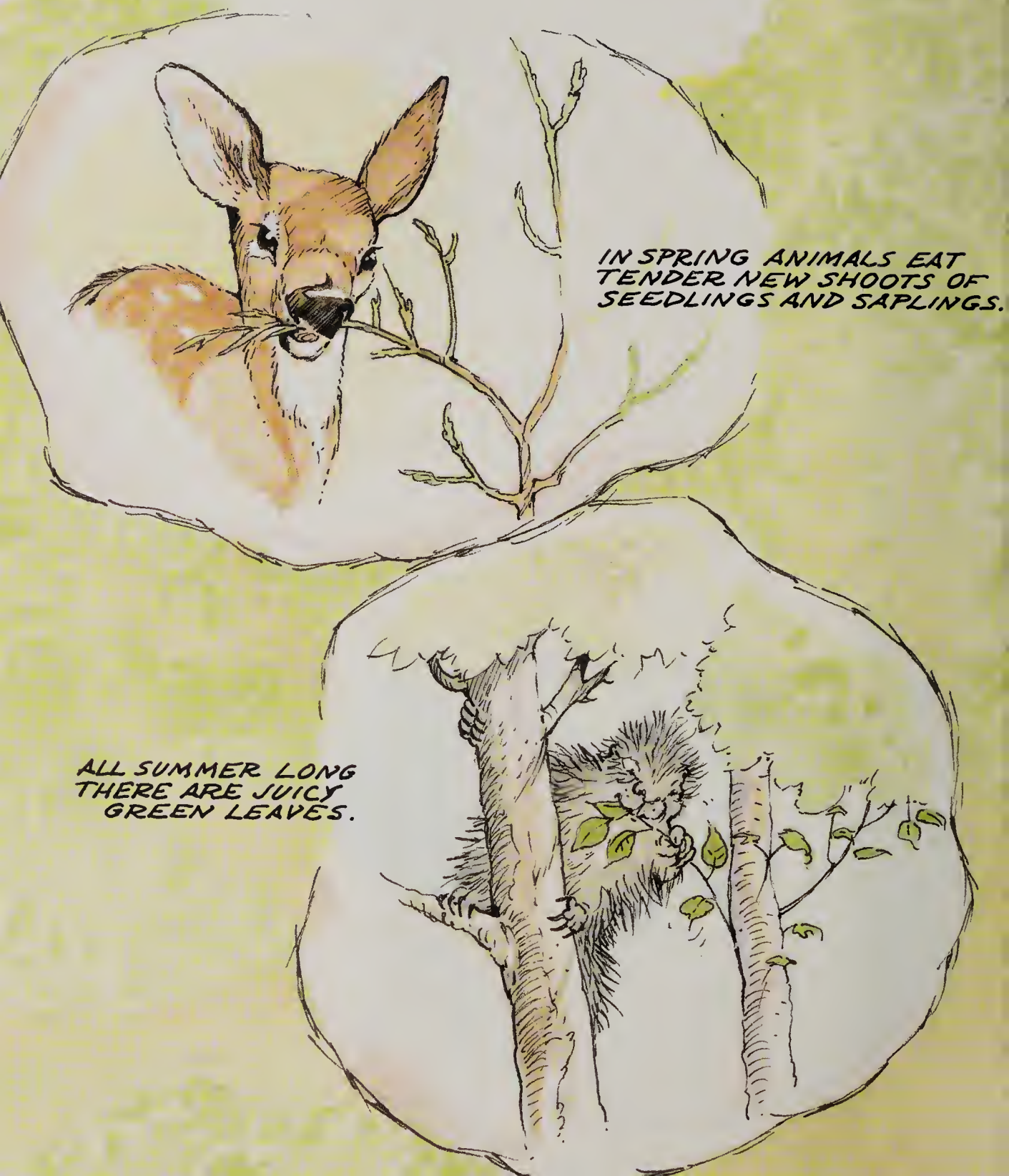
A hardwood forest is an open, airy place. Breezes carry the scent of green leaves and bark. Spots of sunlight dapple the tree trunks. Noises echo sharply as they bounce off the hardwood trees. Brittle fallen leaves crackle under your step.

The ideal woods for wildlife has a rich variety of trees of all ages, shapes, and sizes. In a mixed woods there are a number of levels—"floors" where different animals can find living space.

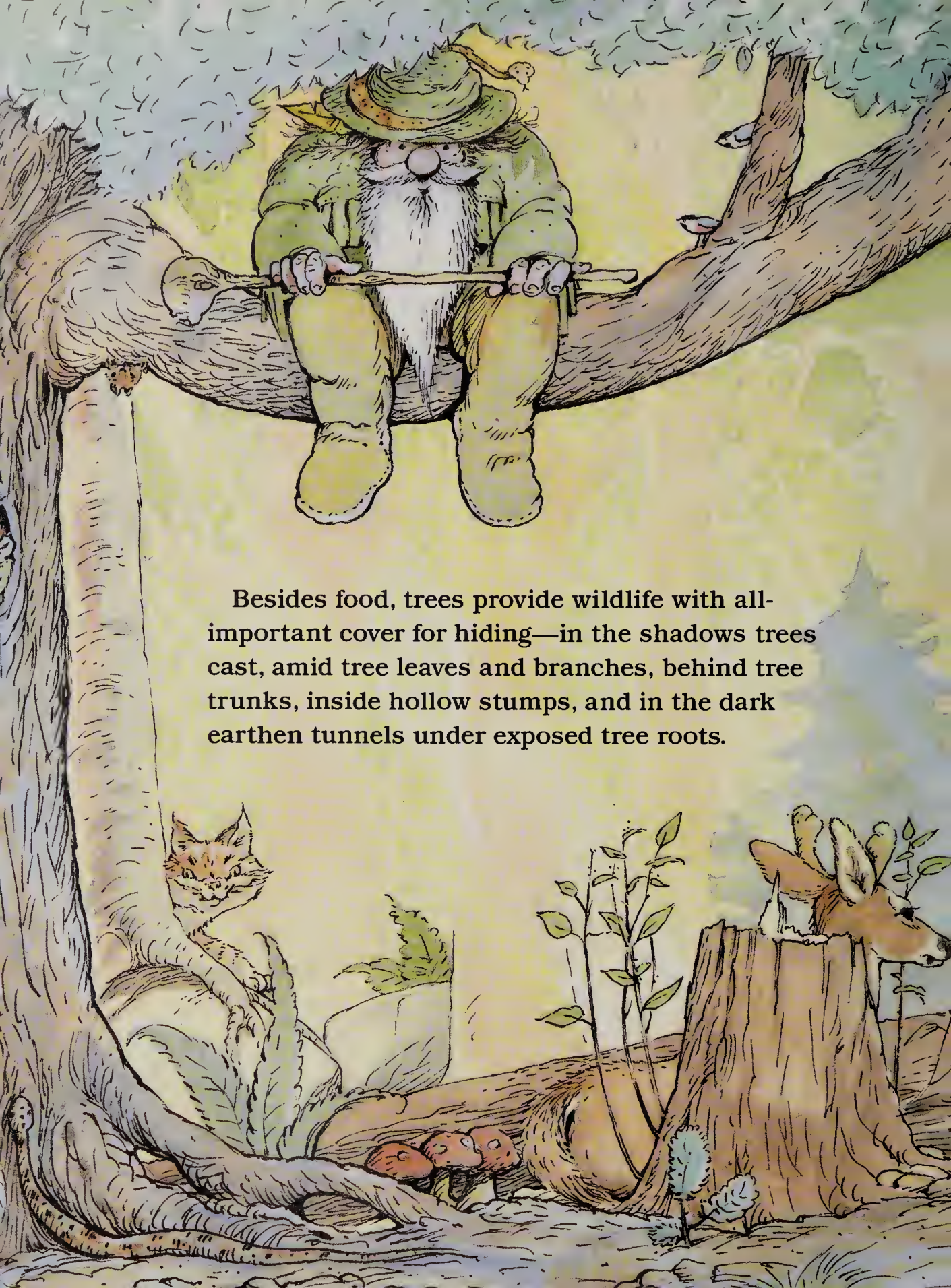


Look in the highest treetops...
in the middle limbs and branches...
and near or on the ground.

In a mixed woods, seedlings, saplings, and mature broad-leafed trees and evergreens produce a variety of food that wildlife can eat the year round.



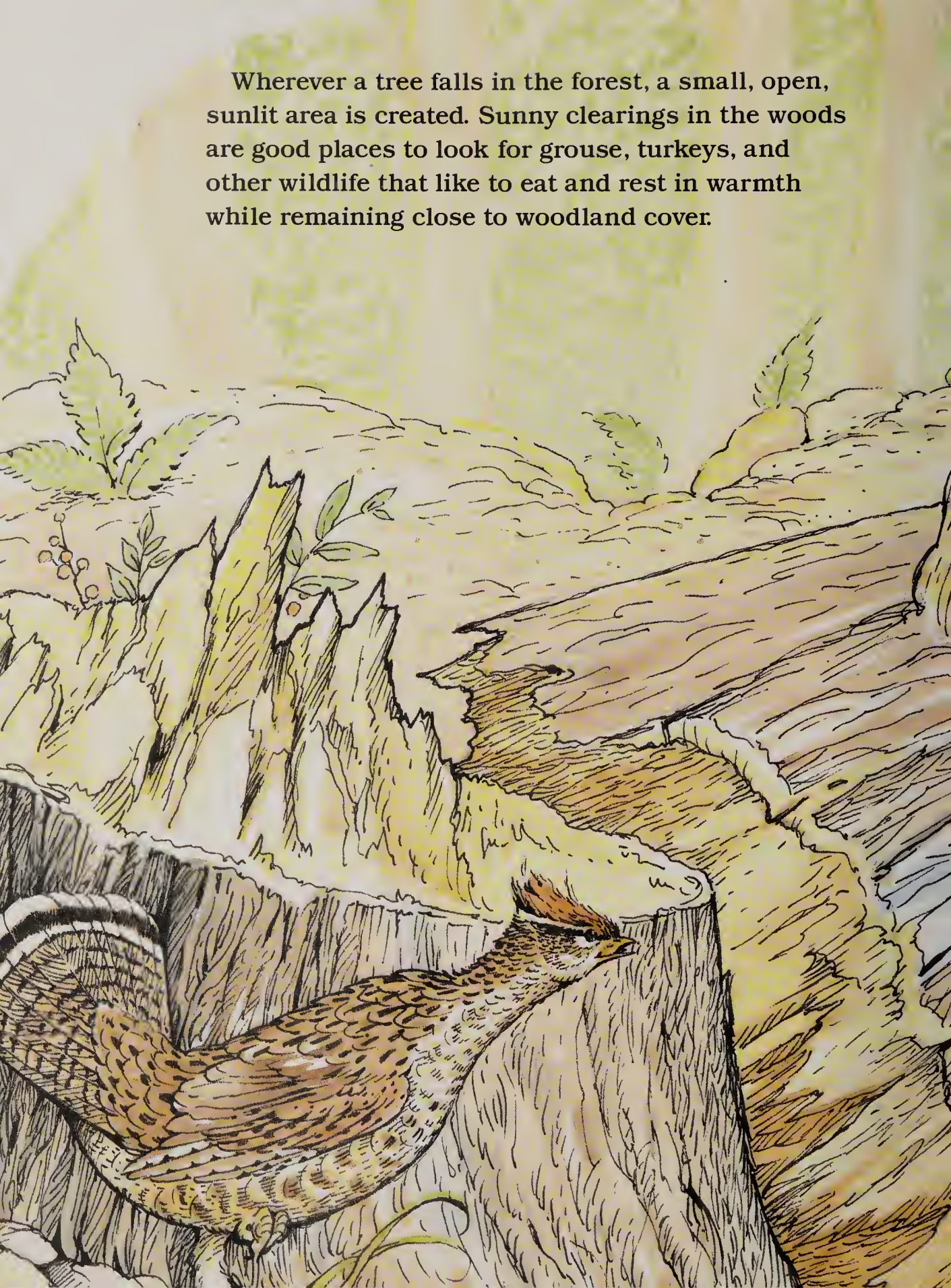
FALL IS THE SEASON FOR TREE SEEDS AND NUTS.
IN WINTER ANIMALS EAT THE TINY WINTER-BUDS THAT HAVE FORMED ON THE LEAFLESS BRANCHES.

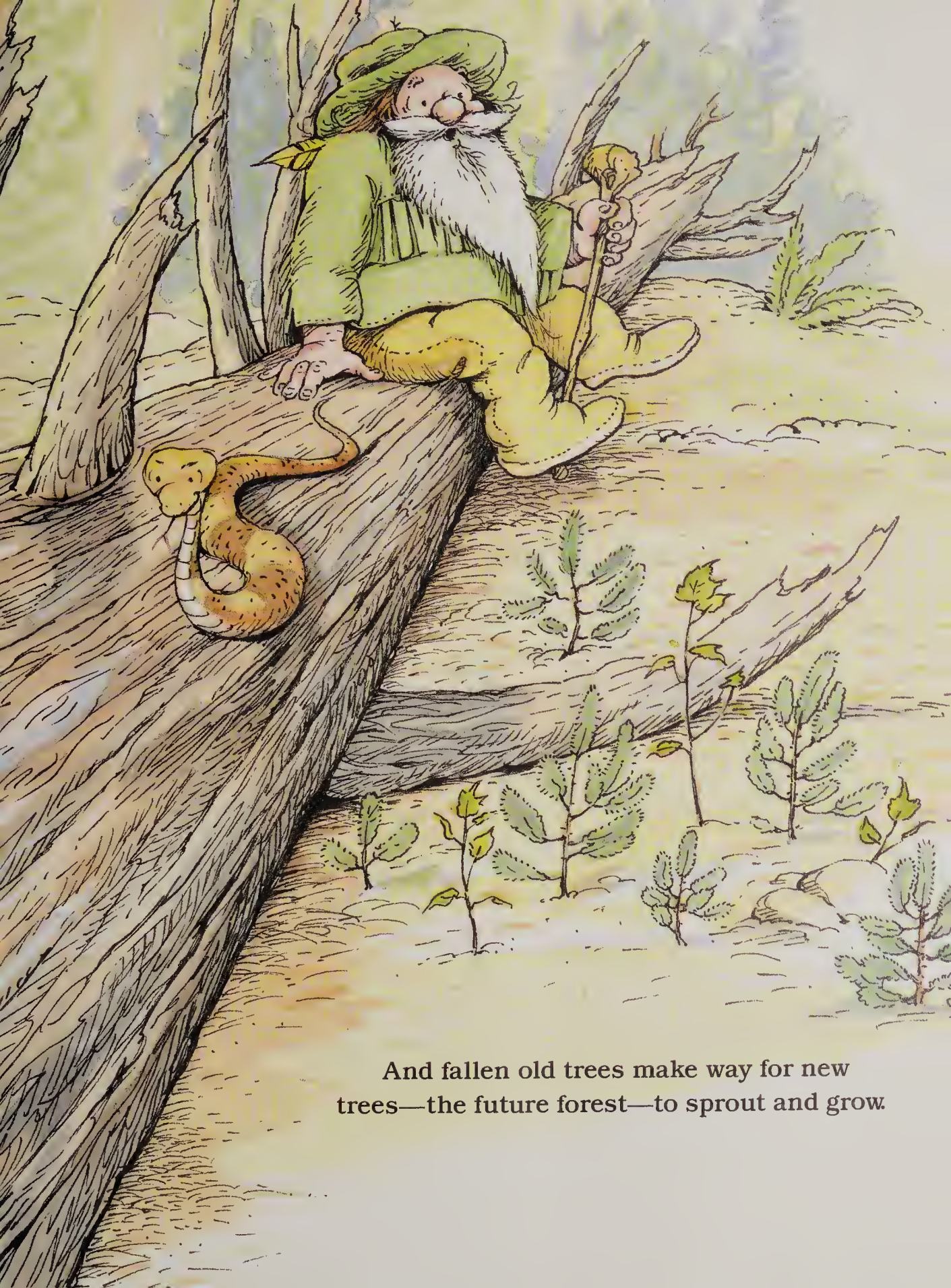


Besides food, trees provide wildlife with all-important cover for hiding—in the shadows trees cast, amid tree leaves and branches, behind tree trunks, inside hollow stumps, and in the dark earthen tunnels under exposed tree roots.

Dying or dead but still standing trees are as important to wildlife as healthy living trees. This hollow tree trunk is home to scores of wood-boring insects, which are food for raccoons, opossums, skunks, bears, and of course, woodpeckers! The many deep holes in the rotted wood excavated by animals searching for insects make dandy nesting holes for chickadees and tree-climbing mice. Squirrels use the high, dry holes to store seeds and pinecones.

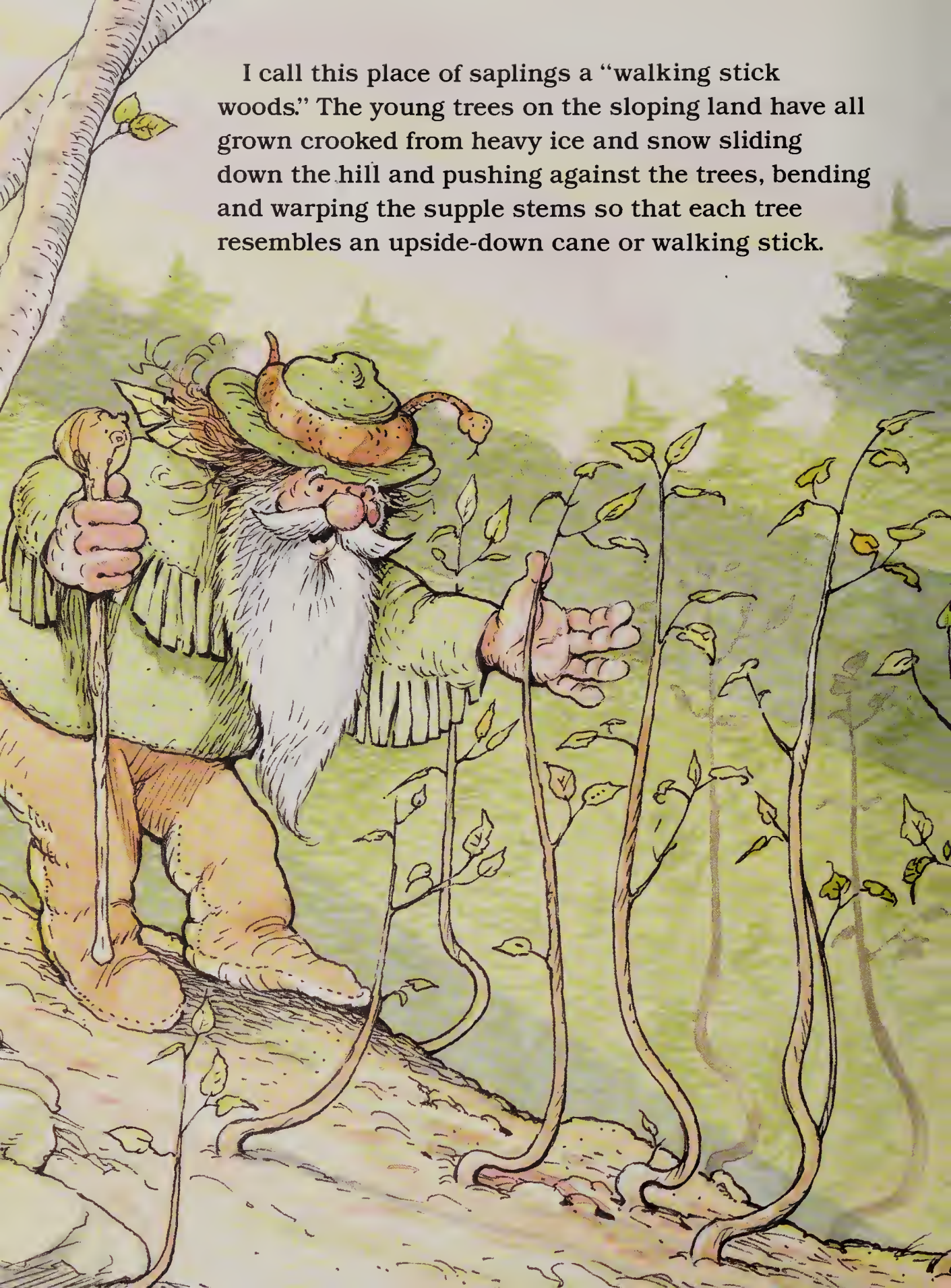
Wherever a tree falls in the forest, a small, open, sunlit area is created. Sunny clearings in the woods are good places to look for grouse, turkeys, and other wildlife that like to eat and rest in warmth while remaining close to woodland cover.

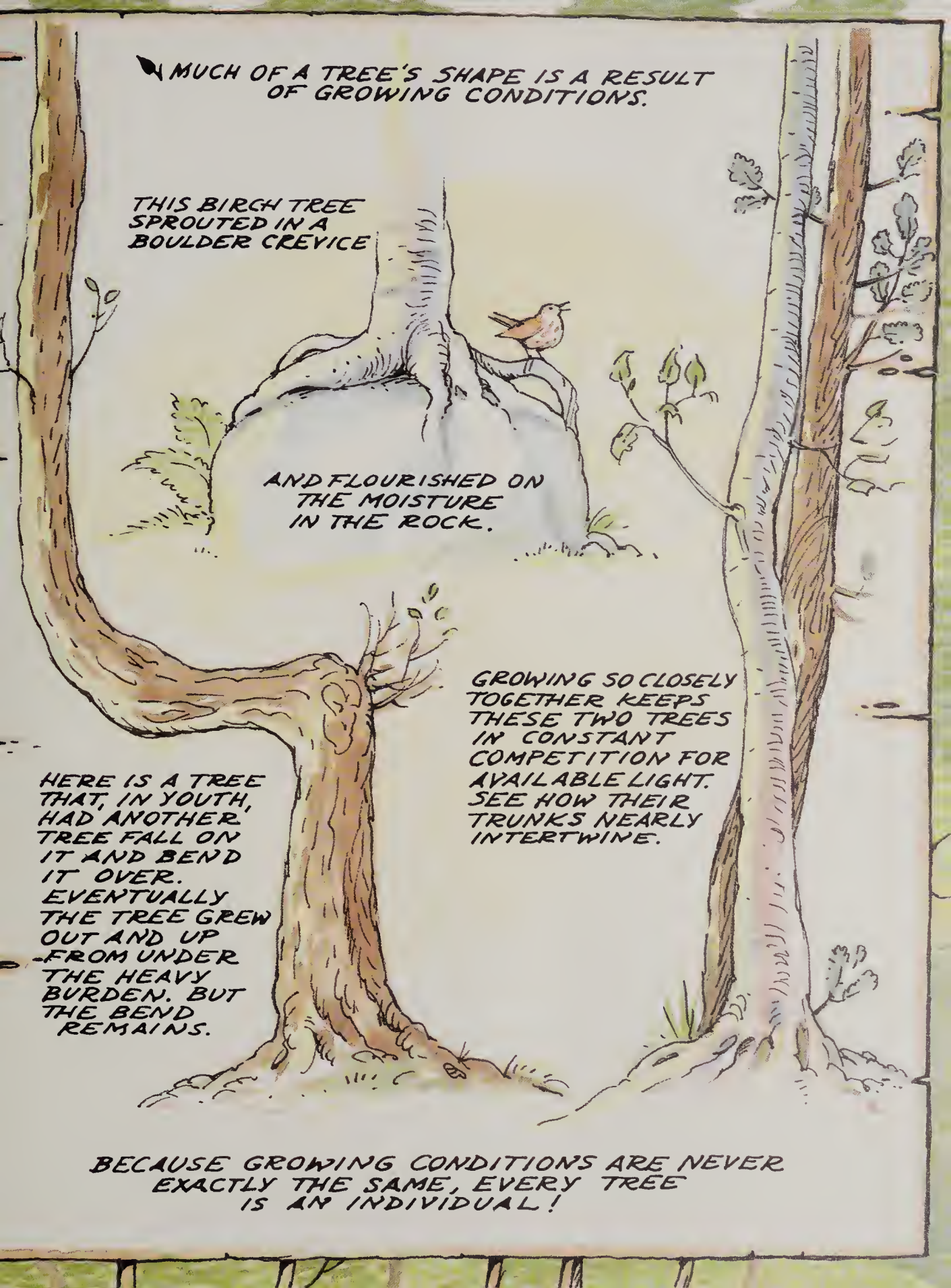


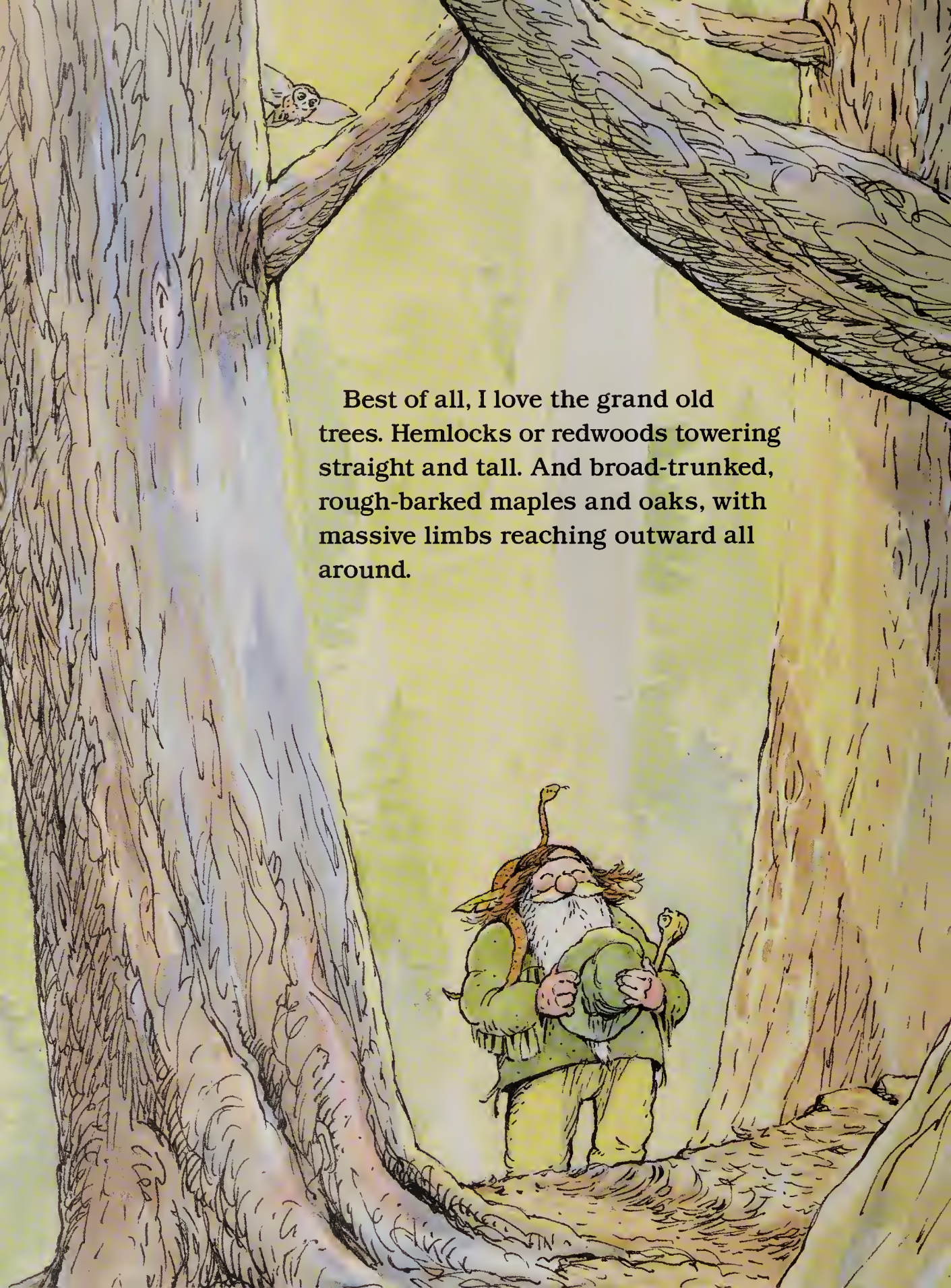


And fallen old trees make way for new trees—the future forest—to sprout and grow.

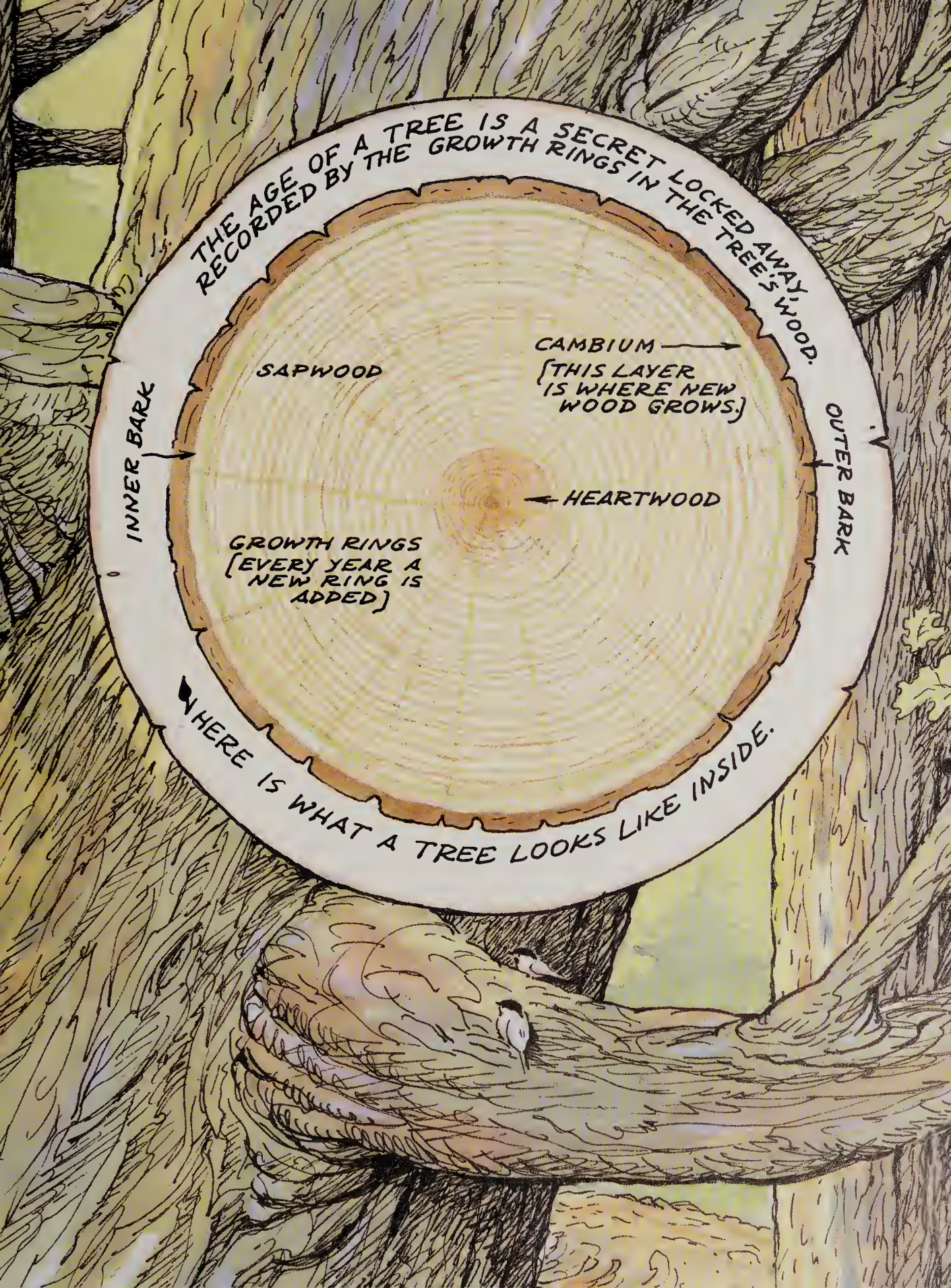
I call this place of saplings a "walking stick woods." The young trees on the sloping land have all grown crooked from heavy ice and snow sliding down the hill and pushing against the trees, bending and warping the supple stems so that each tree resembles an upside-down cane or walking stick.



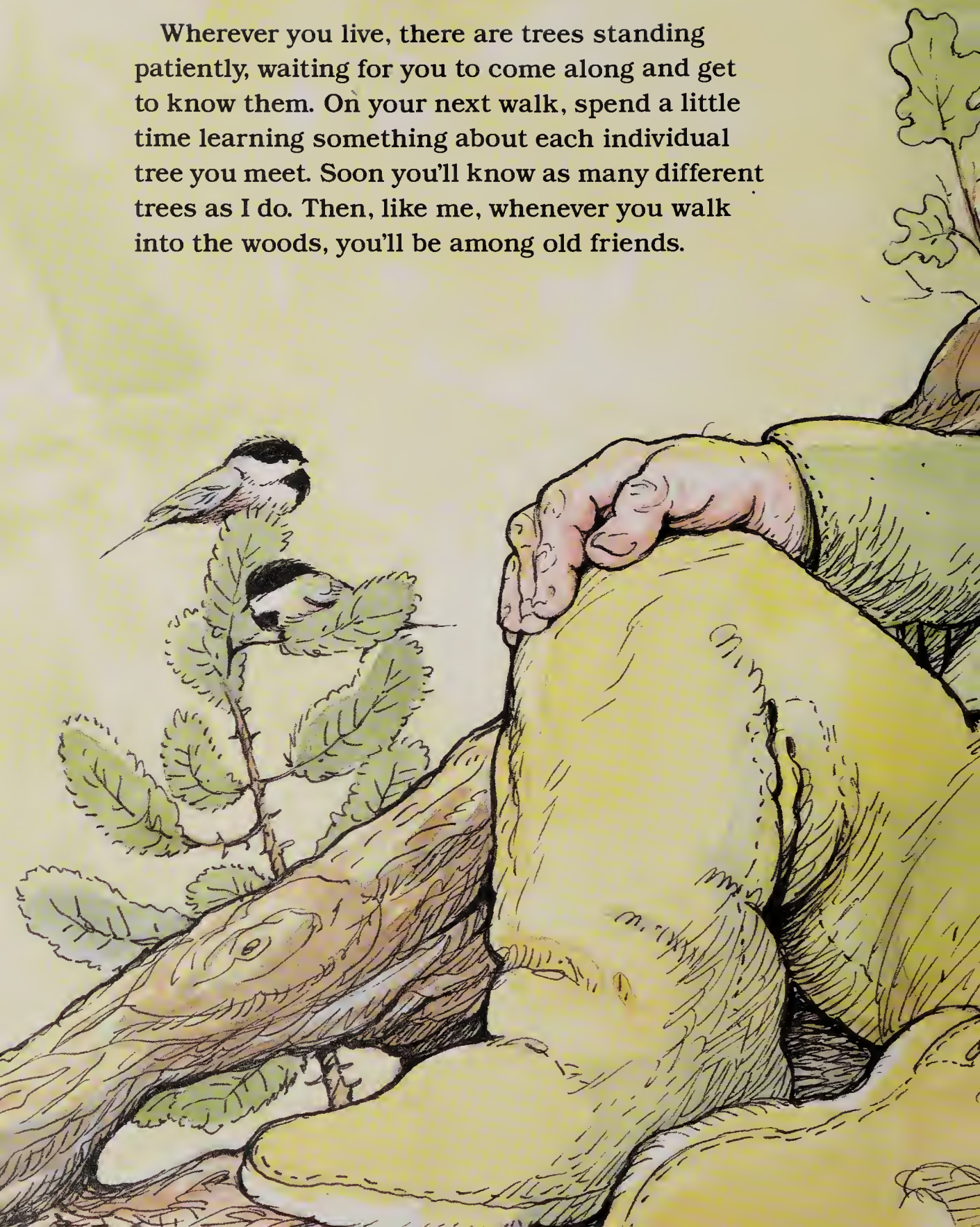

MUCH OF A TREE'S SHAPE IS A RESULT OF GROWING CONDITIONS.
THIS BIRCH TREE SPROUTED IN A BOULDER CREVICE
AND FLOURISHED ON THE MOISTURE IN THE ROCK.
GROWING SO CLOSELY TOGETHER KEEPS THESE TWO TREES IN CONSTANT COMPETITION FOR AVAILABLE LIGHT. SEE HOW THEIR TRUNKS NEARLY INTERTWINE.
HERE IS A TREE THAT, IN YOUTH, HAD ANOTHER TREE FALL ON IT AND BEND IT OVER. EVENTUALLY THE TREE GREW OUT AND UP FROM UNDER THE HEAVY BURDEN. BUT THE BEND REMAINS.
BECAUSE GROWING CONDITIONS ARE NEVER EXACTLY THE SAME, EVERY TREE IS AN INDIVIDUAL!



Best of all, I love the grand old trees. Hemlocks or redwoods towering straight and tall. And broad-trunked, rough-barked maples and oaks, with massive limbs reaching outward all around.


THE AGE OF A TREE IS A SECRET LOCKED AWAY, RECORDED BY THE GROWTH RINGS IN THE TREE'S WOOD.
CAMBIUM
(THIS LAYER IS WHERE NEW WOOD GROWS.)
SAPWOOD
INNER BARK
OUTER BARK
HEARTWOOD
GROWTH RINGS (EVERY YEAR A NEW RING IS ADDED)
HERE IS WHAT A TREE LOOKS LIKE INSIDE.

Wherever you live, there are trees standing patiently, waiting for you to come along and get to know them. On your next walk, spend a little time learning something about each individual tree you meet. Soon you'll know as many different trees as I do. Then, like me, whenever you walk into the woods, you'll be among old friends.



Crinkleroot was named after a wildflower. He tells you where he lives—in the deepest part of the forest—in *I Was Born in a Tree and Raised by Bees.*

He can hear a fox turn in the forest and spot a molehill on a mountain. He can find an owl in daytime, and in *Crinkleroot's Book of Animal Tracking* he shows you how you can, too.

Most days, when Crinkleroot wakes up, his feet are itching to take him places —and you're invited to come along. In fact, *Horn Book Magazine* called *Crinkleroot's Guide to Walking in Wild Places* "a grand invitation to enjoy the natural world."

All of the Crinkleroot books are published by Bradbury Press.

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JIM ARNOSKY began drawing Crinkleroot when he himself lived in a cabin in the woods near Hawk Mountain, Pennsylvania. Winner of the *Washington Post* Children's Book Guild Award for his overall contribution to nonfiction for children, Jim Arnosky is the author of such acclaimed works as *Drawing from Nature*, an ALA Notable Book and a Christopher Award winner.

He is also the 1991 recipient of the Eva L. Gordon Award, given by the American Nature Study Society, for his outstanding children's science literature.

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